

REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections contained in the Office Action of December 15, 2003 is respectfully requested.

Original claims 1-17 were cancelled and claims 18-43 were submitted in the Amendment filed October 6, 2003. In the outstanding Office Action, the Examiner rejected claims 18-43 under 35 USC § 103(a) as being unpatentable over the Mashino reference (USP 6,545,353) in view of the Okabe reference (U.S. Application 2002/0118523). However, independent claims 18 and 32 have been amended as indicated above, and new dependent claims 44-48 have been added. In view of these amendments and for the reasons discussed below, it is respectfully submitted that amended claims 18-48 are clearly patentable over the prior art of record.

Independent claim 18 has now been amended to recite that the ceramic layer has a dielectric constant, and that the *first resin layer has dielectric constant lower than the dielectric constant of the ceramic layer*. Furthermore, the multi-layer board also has a strip line on the first resin layer. As explained in paragraph [0007] of the substitute specification, because the dielectric constant of the first resin layer (corresponding to resin layer 18 of Figure 1) is lower than the dielectric constant of the ceramic layer, a strip line formed on the surface 18a of the first resin layer can be wide, thereby having a reduced loss which is preferable particularly for improving a noise factor during high frequency performance.

As an initial matter, the Examiner asserts that the Mashino reference discloses a ceramic layer 102 and a first resin layer 105 over the ceramic layer. However, as explained in column 4, lines 19 and 20 of the Mashino reference, component 102 is a *metallic* base material, and it is submitted that the Mashino reference does not disclose or suggest a *ceramic layer*, and a first resin layer over a first side of the ceramic layer. Furthermore, regardless of the material of component 102 of the Mashino reference, the Mashino reference does not even discuss the dielectric constant values of any of the components therein, muchless suggest or disclose a desired relationship between the dielectric constant values of the components therein. Thus, the Mashino reference does not disclose or even suggest a first resin layer that has a dielectric constant lower than a dielectric constant of a ceramic layer.

The Okabe reference discloses electronic circuit equipment using a multi-layer circuit board, and the Examiner asserts that the Okabe reference teaches a capacitor structure 52 on a polyimide film 21. However, the Okabe reference also does not disclose or suggest a first resin layer having a dielectric constant lower than a dielectric constant of a ceramic layer. Therefore, one of ordinary skill in the art would not be motivated by the Okabe reference to modify the Mashino reference or to combine the references so as to obtain the invention recited in amended independent claim 18. Accordingly, it is respectfully submitted that amended independent claim 18 and the claims that depend therefrom are clearly patentable over the prior art or record.

Amended independent claim 32 is directed to a multi-layer board that comprises a ceramic layer, an impedance element including *a patterned inductor* on the ceramic layer, and a resin layer over a first side of the ceramic layer. A ground pattern is arranged on the second side of the resin layer, and the ground pattern and the patterned inductor are arranged *so that no portion of the ground pattern is located on the second side of the resin layer opposite a portion of the first side of the resin layer facing the patterned inductor so as to increase a Q-factor of the patterned inductor*.

For the Examiner's benefit, the structural relationship described in claim 32 will be explained with reference to the drawings of the present application. However, reference to the drawings and/or specific portions of the specification is not intended to limit the scope of the claims to the particular embodiments discussed.

The features recited in the last paragraph of independent claim 32 are illustrated in Figure 1 of the present application. Specifically, Figure 1 illustrates a ceramic layer 11, a resin layer 18 over a first side of the ceramic layer 11, and an inductor 13 on the ceramic layer 11. As further illustrated in Figure 1, a ground pattern 19 is formed on a second side (i.e., a side facing upward with respect to Figure 1) of the resin layer 18, and the ground pattern 19 and the patterned inductor 13 are arranged so that no portion of the ground pattern 19 is located on a portion of the second side of the resin layer 18 opposite a portion of the first side (a side facing downward with respect to Figure 1) of the resin layer facing the patterned inductor 13. As explained in paragraph [0015] of the substitute specification, if a portion of the second surface 18a of the resin layer 18 that corresponds to (i.e., is

opposite) inductor 13 is not provided with any ground pattern 19, then the inductor 13 advantageously has an increased Q-factor.

The Examiner asserts that the Mashino reference discloses an impedance element 104 on the ceramic layer. However, as explained in column 5, lines 25-32 of the Mashino reference, reference number 104 indicates a copper plating layer for a condenser electrode. The Mashino reference does not, however, disclose or suggest a *patterned inductor* on a ceramic layer. Moreover, as explained above with respect to independent claim 18, reference number 102 of the Mashino reference discloses a metallic base material, and the Mashino reference does not disclose or suggest a ceramic layer. Furthermore, the Examiner did not indicate which components of the Mashino reference would correspond to the ground pattern as recited in independent claim 32, or explain how the Mashino reference teaches the relationship between the resin layer sides, the patterned inductor, or the ground pattern as recited in claim 32. Because the Mashino reference does not disclose or suggest at least a patterned inductor, the Mashino reference therefore also does not disclose or suggest a ground pattern and a patterned inductor arranged so that no portion of the ground pattern is located on a portion of the second side of the resin layer opposite a portion of the first side of the resin layer that faces a patterned inductor.

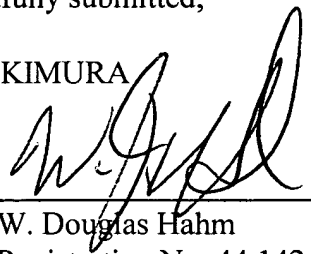
It is submitted that the Okabe reference also does not disclose or suggest a patterned inductor, or a ground pattern, a resin layer, and a patterned inductor arranged as recited in amended independent claim 32. Therefore, one of ordinary skill in the art would not be motivated by the Okabe reference to modify the Mashino reference or to combine the references so as to obtain the invention as recited in independent claim 32. Accordingly, it is respectfully submitted that independent claim 32 and the claims that depend therefrom are clearly patentable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. However, if the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact the Applicant's undersigned representative.

Respectfully submitted,

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